



SEQUENCE LISTING

<110> Matsui, Ikuo
Ishikawa, Kazuhiko
Ishida, Hiroyasu
Kosugi, Yoshitsugu

<120> METHODS FOR MAKING AND USING A THERMOPHILIC
ENZYME AS A BETA-GLYCOSIDASE (AMENDED)

<130> 11059/002001

<140> 09/369,735

<141> 1999-08-06

<160> 9

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1269

<212> DNA

<213> Pyrococcus horikoshii

<220>

<221> CDS

<222> (1)...(1269)

<400> 1

atg ccg ctg aaa ttc ccg gaa atg ttt ctc ttt ggt acc gca aca tca	48
Met Pro Leu Lys Phe Pro Glu Met Phe Leu Phe Gly Thr Ala Thr Ser	
1 5 10 15	
tcc cat cag ata gag gga aat aat aga tgg aat gat tgg tgg tac tat	96
Ser His Gln Ile Glu Gly Asn Asn Arg Trp Asn Asp Trp Trp Tyr Tyr	
20 25 30	
gag cag att gga aag ctc ccc tac aga tct ggt aag gct tgc aat cac	144
Glu Gln Ile Gly Lys Leu Pro Tyr Arg Ser Gly Lys Ala Cys Asn His	
35 40 45	
tgg gaa ctt tac agg gat gat att cag cta atg acc agc ttg ggc tat	192
Trp Glu Leu Tyr Arg Asp Asp Ile Gln Leu Met Thr Ser Leu Gly Tyr	
50 55 60	
aat gct tat agg ttc tcc ata gag tgg agc agg cta ttc cca gag gaa	240
Asn Ala Tyr Arg Phe Ser Ile Glu Trp Ser Arg Leu Phe Pro Glu Glu	
65 70 75 80	
aat aaa ttt aat gaa gat gct ttc atg aaa tac cgg gag att ata gac	288
Asn Lys Phe Asn Glu Asp Ala Phe Met Lys Tyr Arg Glu Ile Ile Asp	
85 90 95	
ttg tta ttg acg aga ggt ata act ccc ctg gtg acc cta cac cac ttt	336
Leu Leu Leu Thr Arg Gly Ile Thr Pro Leu Val Thr Leu His His Phe	
100 105 110	
act agc cct ctc tgg ttc atg aag aaa ggt ggc ttc ctt agg gag gag	384
Thr Ser Pro Leu Trp Phe Met Lys Lys Gly Gly Phe Leu Arg Glu Glu	
115 120 125	

aac cta aaa cat tgg gaa aag tac ata gaa aag gtt gct gag ctt tta Asn Leu Lys His Trp Glu Lys Tyr Ile Glu Lys Val Ala Glu Leu Leu 130 135 140	432
gaa aaa gtt aaa cta gta gct acc ttc aat gag ccg atg gta tac gta Glu Lys Val Lys Leu Val Ala Thr Phe Asn Glu Pro Met Val Tyr Val 145 150 155 160	480
atg atg gga tat cta acg gct tat tgg ccc cca ttc att agg agt cca Met Met Gly Tyr Leu Thr Ala Tyr Trp Pro Pro Phe Ile Arg Ser Pro 165 170 175	528
ttt aag gcc ttt aag gta gct gca aac ctg ctt aaa gct cac gca att Phe Lys Ala Phe Lys Val Ala Ala Asn Leu Leu Lys Ala His Ala Ile 180 185 190	576
gcc tat gaa ctt ctt cat ggg aaa ttc aaa gtt gga atc gta aag aat Ala Tyr Glu Leu Leu His Gly Lys Phe Lys Val Gly Ile Val Lys Asn 195 200 205	624
att ccc ata ata ctc cca gcg agt gac aag gag agg gat aga aaa gcc Ile Pro Ile Ile Leu Pro Ala Ser Asp Lys Glu Arg Asp Arg Lys Ala 210 215 220	672
gct gag aaa gct gat aat tta ttt aac tgg cac ttt ttg gat gcg ata Ala Glu Lys Ala Asp Asn Leu Phe Asn Trp His Phe Leu Asp Ala Ile 225 230 235 240	720
tgg agt ggg aaa tac aga ggg gta ttt aaa aca tat agg att ccc caa Trp Ser Gly Lys Tyr Arg Gly Val Phe Lys Thr Tyr Arg Ile Pro Gln 245 250 255	768
agt gac gca gat ttc att ggg gtt aac tat tac acg gcc agc gaa gta Ser Asp Ala Asp Phe Ile Gly Val Asn Tyr Tyr Thr Ala Ser Glu Val 260 265 270	816
agg cat act tgg aat cct tta aaa ttc ttc ttt gag gtg aaa tta gcg Arg His Thr Trp Asn Pro Leu Lys Phe Phe Phe Glu Val Lys Leu Ala 275 280 285	864
gat att agc gag agg aag act caa atg gga tgg agc gtt tat cca aaa Asp Ile Ser Glu Arg Lys Thr Gln Met Gly Trp Ser Val Tyr Pro Lys 290 295 300	912
gga ata tac atg gcc ctt aaa aaa gct tcc agg tat gga agg cct ctt Gly Ile Tyr Met Ala Leu Lys Lys Ala Ser Arg Tyr Gly Arg Pro Leu 305 310 315 320	960
tat att acg gaa aac gga ata gcg acg ctt gat gat gaa tgg aga gtg Tyr Ile Thr Glu Asn Gly Ile Ala Thr Leu Asp Asp Glu Trp Arg Val 325 330 335	1008
gaa ttc ata att caa cac ctc caa tac gtt cat aag gct atc gaa gac Glu Phe Ile Ile Gln His Leu Gln Tyr Val His Lys Ala Ile Glu Asp 340 345 350	1056
ggc ctg gat gta aga ggt tac ttc tat tgg tca ttt atg gat aac tac Gly Leu Asp Val Arg Gly Tyr Phe Tyr Trp Ser Phe Met Asp Asn Tyr 355 360 365	1104

gag tgg aaa gag ggg ttt ggg cct aga ttt ggc cta gtg gaa gtt gat	1152
Glu Trp Lys Glu Gly Phe Gly Pro Arg Phe Gly Leu Val Glu Val Asp	
370 375 380	
tat caa acc ttc gag aga agg ccc agg aag agt gct tac gta tac gga	1200
Tyr Gln Thr Phe Glu Arg Pro Arg Lys Ser Ala Tyr Val Tyr Gly	
385 390 395 400	
gaa att gca aga agt aag gaa ata aag gat gag cta tta aag aga tat	1248
Glu Ile Ala Arg Ser Lys Glu Ile Lys Asp Glu Leu Leu Lys Arg Tyr	
405 410 415	
ggc cta cca gaa ctt caa ctt	1269
Gly Leu Pro Glu Leu Gln Leu	
420	

<210> 2

<211> 423

<212> PRT

<213> Pyrococcus horikoshii

<400> 2

Met Pro Leu Lys Phe Pro Glu Met Phe Leu Phe Gly Thr Ala Thr Ser	
1 5 10 15	
Ser His Gln Ile Glu Gly Asn Asn Arg Trp Asn Asp Trp Trp Tyr Tyr	
20 25 30	
Glu Gln Ile Gly Lys Leu Pro Tyr Arg Ser Gly Lys Ala Cys Asn His	
35 40 45	
Trp Glu Leu Tyr Arg Asp Asp Ile Gln Leu Met Thr Ser Leu Gly Tyr	
50 55 60	
Asn Ala Tyr Arg Phe Ser Ile Glu Trp Ser Arg Leu Phe Pro Glu Glu	
65 70 75 80	
Asn Lys Phe Asn Glu Asp Ala Phe Met Lys Tyr Arg Glu Ile Ile Asp	
85 90 95	
Leu Leu Leu Thr Arg Gly Ile Thr Pro Leu Val Thr Leu His His Phe	
100 105 110	
Thr Ser Pro Leu Trp Phe Met Lys Lys Gly Gly Phe Leu Arg Glu Glu	
115 120 125	
Asn Leu Lys His Trp Glu Lys Tyr Ile Glu Lys Val Ala Glu Leu Leu	
130 135 140	
Glu Lys Val Lys Leu Val Ala Thr Phe Asn Glu Pro Met Val Tyr Val	
145 150 155 160	
Met Met Gly Tyr Leu Thr Ala Tyr Trp Pro Pro Phe Ile Arg Ser Pro	
165 170 175	
Phe Lys Ala Phe Lys Val Ala Ala Asn Leu Leu Lys Ala His Ala Ile	
180 185 190	
Ala Tyr Glu Leu Leu His Gly Lys Phe Lys Val Gly Ile Val Lys Asn	
195 200 205	
Ile Pro Ile Ile Leu Pro Ala Ser Asp Lys Glu Arg Asp Arg Lys Ala	
210 215 220	
Ala Glu Lys Ala Asp Asn Leu Phe Asn Trp His Phe Leu Asp Ala Ile	
225 230 235 240	
Trp Ser Gly Lys Tyr Arg Gly Val Phe Lys Thr Tyr Arg Ile Pro Gln	
245 250 255	
Ser Asp Ala Asp Phe Ile Gly Val Asn Tyr Tyr Thr Ala Ser Glu Val	
260 265 270	
Arg His Thr Trp Asn Pro Leu Lys Phe Phe Phe Glu Val Lys Leu Ala	
275 280 285	
Asp Ile Ser Glu Arg Lys Thr Gln Met Gly Trp Ser Val Tyr Pro Lys	
290 295 300	

Gly Ile Tyr Met Ala Leu Lys Lys Ala Ser Arg Tyr Gly Arg Pro Leu
 305 310 315 320
 Tyr Ile Thr Glu Asn Gly Ile Ala Thr Leu Asp Asp Glu Trp Arg Val
 325 330 335
 Glu Phe Ile Ile Gln His Leu Gln Tyr Val His Lys Ala Ile Glu Asp
 340 345 350
 Gly Leu Asp Val Arg Gly Tyr Phe Tyr Trp Ser Phe Met Asp Asn Tyr
 355 360 365
 Glu Trp Lys Glu Gly Phe Gly Pro Arg Phe Gly Leu Val Glu Val Asp
 370 375 380
 Tyr Gln Thr Phe Glu Arg Arg Pro Arg Lys Ser Ala Tyr Val Tyr Gly
 385 390 395 400
 Glu Ile Ala Arg Ser Lys Glu Ile Lys Asp Glu Leu Leu Lys Arg Tyr
 405 410 415
 Gly Leu Pro Glu Leu Gln Leu
 420

<210> 3
 <211> 57
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> An upper primer designed to create the NdeI site.

<400> 3
 taagaaggag atatacatat gccgctgaaa ttcccggaaa tgtttctctt tggtagc

57

<210> 4
 <211> 46
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> A lower primer designed to create the BamHI site.

<400> 4
 tttactgcag agaggatccc taatcctaaa gttgaagttc tggtag

46

<210> 5
 <211> 483
 <212> PRT
 <213> Pyrococcus horikoshii

<400> 5
 Met Lys Phe Tyr Trp Gly Val Val Gln Ser Ala Phe Gln Phe Glu Met
 1 5 10 15
 Gly Asp Pro Tyr Arg Arg Asn Ile Asp Pro Arg Ser Asp Trp Trp Tyr
 20 25 30
 Trp Val Arg Asp Pro Tyr Asn Ile Lys Asn Asp Leu Val Ser Gly Asp
 35 40 45
 Leu Pro Glu Glu Gly Ile Asn Asn Tyr Glu Leu Tyr Glu Ile Asp His
 50 55 60
 Arg Leu Ala Lys Glu Leu Gly Leu Asn Ala Tyr Gln Leu Thr Ile Glu
 65 70 75 80
 Trp Ser Arg Ile Phe Pro Cys Pro Thr Phe Asn Val Glu Val Glu Phe
 85 90 95
 Glu Arg Asp Asx Tyr Gly Leu Ile Lys Lys Val Lys Ile Glu Lys Glu
 100 105 110
 His Leu Glu Glu Leu Asp Lys Leu Ala Asn Gln Lys Glu Val Arg His
 115 120 125

Tyr Leu Asn Val Leu Arg Asn Leu Lys Lys Leu Gly Phe Thr Thr Phe
 130 135 140
 Val Thr Leu Asn His Gln Thr Asn Pro Ile Trp Ile His Asp Pro Ile
 145 150 155 160
 Glu Thr Arg Gly Asn Phe Gln Lys Ala Arg Ala Pro Gly Trp Val Asp
 165 170 175
 Glu Arg Thr Ile Ile Glu Phe Ala Lys Tyr Ala Ala Tyr Val Ala Trp
 180 185 190
 Lys Phe Asp Asn Tyr Val Asp Tyr Trp Ser Thr Phe Asp Glu Pro Met
 195 200 205
 Val Thr Ala Glu Leu Gly Tyr Leu Ala Pro Tyr Val Gly Trp Pro Pro
 210 215 220
 Gly Ile Leu Asn Pro Ser Ala Ala Lys Lys Val Ile Ile Asn Gln Ile
 225 230 235 240
 Val Ala His Ala Pro Ala Tyr Asp Ser Ile Lys Lys Phe Ser Ser Lys
 245 250 255
 Pro Val Gly Val Ile Leu Asn Ile Ile Pro Ala Tyr Pro Leu Asp Pro
 260 265 270
 Asn Asp Ser Lys Ser Val Arg Ala Ala Glu Asn Tyr Asp Leu Phe His
 275 280 285
 Asn Arg Leu Phe Leu Glu Ala Val Asn Arg Gly Asn Val Asp Leu Asp
 290 295 300
 Ile Thr Gly Glu Tyr Thr Lys Ile Pro His Ile Lys Arg Asn Asp Trp
 305 310 315 320
 Ile Gly Asn Asn Tyr Thr Arg Glu Val Val Lys Tyr Val Glu Pro
 325 330 335
 Lys Tyr Glu Glu Leu Pro Leu Ile Thr Phe Val Gly Val Glu Gly Tyr
 340 345 350
 Gly Tyr Ser Gly Asn Pro Asn Ser Leu Ser Pro Asp Asn Asn Pro Thr
 355 360 365
 Ser Asp Phe Gly Trp Glu Val Phe Pro Gln Gly Leu Tyr Asp Ser Thr
 370 375 380
 Leu Glu Ala Ala Glu Tyr Asn Lys Glu Val Phe Ile Thr Glu Asn Gly
 385 390 395 400
 Ile Ala Asp Ser Lys Asp Ile Leu Arg Pro Arg Tyr Ile Ile Asp His
 405 410 415
 Val Asn Glu Val Lys Lys Leu Ile Glu Asn Gly Ile Lys Val Gly Gly
 420 425 430
 Tyr Phe His Trp Ala Leu Thr Asp Asn Tyr Glu Trp Ala Met Gly Phe
 435 440 445
 Lys Ile Arg Phe Gly Leu Tyr Glu Val Asp Leu Ile Thr Lys Glu Arg
 450 455 460
 Ile Pro Arg Arg Arg Ser Val Glu Ile Tyr Lys Lys Ile Val Met Glu
 465 470 475 480
 Gly Ile Glu

<210> 6

<211> 510

<212> PRT

<213> *Pyrococcus furiosus*

<400> 6

Met Phe Pro Glu Met Phe Leu Trp Gly Val Ala Gln Ser Gly Phe Gln
 1 5 10 15
 Phe Glu Met Gly Asp Lys Leu Arg Arg Asn Ile Asp Thr Asn Thr Asp
 20 25 30
 Trp Trp His Trp Val Arg Asp Lys Thr Asn Ile Glu Lys Gly Leu Val
 35 40 45
 Ser Gly Asp Leu Pro Glu Glu Gly Ile Asn Asn Tyr Glu Leu Tyr Glu
 50 55 60

Lys	Asp	His	Glu	Ile	Ala	Arg	Lys	Leu	Gly	Leu	Asn	Ala	Tyr	Arg	Ile
65					70					75					80
Gly	Ile	Glu	Trp	Ser	Arg	Ile	Phe	Pro	Trp	Pro	Thr	Thr	Phe	Ile	Asp
				85					90					95	
Val	Asp	Tyr	Ser	Tyr	Asn	Glu	Ser	Tyr	Asn	Leu	Ile	Glu	Asp	Val	Lys
			100					105					110		
Ile	Thr	Lys	Asp	Thr	Leu	Glu	Glu	Leu	Asp	Glu	Ile	Ala	Asn	Lys	Arg
		115					120					125			
Glu	Val	Ala	Tyr	Tyr	Arg	Ser	Val	Ile	Asn	Ser	Leu	Arg	Ser	Lys	Gly
	130					135				140					
Phe	Lys	Val	Ile	Val	Asn	Leu	Asn	His	Phe	Thr	Leu	Pro	Tyr	Trp	Asp
145					150					155					160
His	Asp	Pro	Ile	Glu	Ala	Arg	Glu	Arg	Ala	Leu	Thr	Asn	Lys	Arg	Asn
			165						170					175	
Gly	Trp	Val	Asn	Pro	Arg	Thr	Val	Ile	Glu	Phe	Ala	Lys	Tyr	Ala	Ala
			180					185					190		
Tyr	Ile	Ala	Tyr	Lys	Phe	Gly	Asp	Ile	Val	Asp	Met	Trp	Ser	Thr	Phe
	195						200					205			
Asn	Glu	Pro	Met	Val	Val	Val	Glu	Leu	Gly	Tyr	Leu	Ala	Pro	Tyr	Ser
	210					215					220				
Gly	Phe	Pro	Pro	Gly	Val	Leu	Asn	Pro	Glu	Ala	Ala	Lys	Leu	Ala	Ile
225					230					235					240
Leu	His	Met	Ile	Asn	Ala	His	Ala	Leu	Ala	Tyr	Arg	Gln	Ile	Lys	Lys
			245						250					255	
Phe	Asp	Thr	Glu	Lys	Ala	Asp	Lys	Asp	Ser	Lys	Glu	Pro	Ala	Glu	Val
		260						265					270		
Gly	Ile	Ile	Tyr	Asn	Asn	Ile	Gly	Val	Ala	Tyr	Pro	Lys	Asp	Pro	Asn
	275						280					285			
Asp	Ser	Lys	Asp	Val	Lys	Ala	Ala	Glu	Asn	Asp	Asn	Phe	Phe	His	Ser
	290					295					300				
Gly	Leu	Phe	Phe	Glu	Ala	Ile	His	Lys	Gly	Lys	Leu	Asn	Ile	Glu	Phe
305					310					315					320
Asp	Gly	Glu	Thr	Phe	Ile	Asp	Ala	Pro	Tyr	Leu	Lys	Gly	Asn	Asp	Trp
			325						330					335	
Ile	Gly	Met	Asn	Tyr	Tyr	Thr	Arg	Glu	Val	Val	Thr	Tyr	Gln	Glu	Pro
		340						345					350		
Met	Phe	Pro	Ser	Ile	Pro	Leu	Ile	Thr	Phe	Lys	Gly	Val	Gln	Gly	Tyr
	355						360					365			
Gly	Tyr	Ala	Cys	Arg	Pro	Gly	Thr	Gln	Ser	Lys	Asp	Asp	Arg	Pro	Val
	370					375					380				
Ser	Asp	Ile	Gly	Trp	Glu	Leu	Tyr	Pro	Glu	Gly	Met	Tyr	Asp	Ser	Ile
385					390					395					400
Val	Glu	Ala	His	Lys	Tyr	Gly	Val	Pro	Val	Tyr	Val	Thr	Glu	Asn	Gly
			405						410					415	
Ile	Ala	Asp	Ser	Lys	Asp	Ile	Leu	Arg	Pro	Tyr	Tyr	Ile	Ala	Ser	His
		420						425					430		
Ile	Lys	Met	Ile	Glu	Lys	Ala	Phe	Glu	Asp	Gly	Tyr	Glu	Val	Lys	Gly
	435						440					445			
Tyr	Phe	His	Trp	Ala	Leu	Thr	Asp	Asn	Phe	Glu	Trp	Ala	Leu	Gly	Phe
	450					455					460				
Arg	Met	Arg	Phe	Gly	Leu	Tyr	Glu	Val	Asn	Leu	Ile	Thr	Lys	Glu	Arg
465					470					475					480
Ile	Pro	Arg	Glu	Lys	Ser	Val	Ser	Ile	Phe	Arg	Glu	Ile	Val	Ala	Asn
			485						490					495	
Asn	Gly	Val	Thr	Lys	Lys	Ile	Glu	Glu	Glu	Leu	Leu	Arg	Gly		
		500						505					510		

<210> 7

<211> 472

<212> PRT

<213> Pyrococcus furiosus

<400> 7

Met	Lys	Phe	Pro	Lys	Met	Phe	Met	Phe	Gly	Tyr	Ser	Trp	Ser	Gly	Pro
1				5					10					15	
Gln	Phe	Glu	Met	Gly	Leu	Pro	Gly	Ser	Glu	Val	Glu	Ser	Asp	Trp	Trp
			20					25					30		
Val	Trp	Val	His	Asp	Lys	Glu	Asn	Ile	Ala	Ser	Gly	Leu	Val	Ser	Gly
		35					40					45			
Asp	Leu	Pro	Glu	Asn	Gly	Pro	Ala	Tyr	Trp	His	Ile	Tyr	Lys	Gln	Asp
	50				55					60					
His	Asp	Ile	Ala	Glu	Lys	Leu	Gly	Met	Asp	Cys	Ile	Arg	Gly	Gly	Ile
65				70					75						80
Glu	Trp	Ala	Arg	Ile	Phe	Pro	Lys	Pro	Thr	Phe	Asp	Val	Lys	Val	Asp
			85						90					95	
Val	Glu	Lys	Asp	Glu	Glu	Gly	Asn	Ile	Ile	Ser	Val	Asp	Val	Pro	Glu
			100				105						110		
Ser	Thr	Ile	Lys	Glu	Leu	Glu	Lys	Ile	Ala	Asn	Met	Glu	Ala	Leu	Glu
		115					120					125			
His	Tyr	Arg	Lys	Ile	Tyr	Ser	Asp	Trp	Lys	Glu	Pro	Gly	Lys	Thr	Phe
	130					135					140				
Ile	Leu	Asn	Leu	Tyr	His	Trp	Pro	Leu	Pro	Leu	Trp	Ile	His	Asp	Pro
145				150					155						160
Ile	Ala	Val	Arg	Lys	Leu	Gly	Pro	Asp	Arg	Ala	Pro	Ala	Gly	Trp	Leu
			165						170					175	
Asp	Glu	Lys	Thr	Val	Val	Glu	Phe	Val	Lys	Phe	Ala	Ala	Phe	Val	Ala
			180				185						190		
Tyr	His	Leu	Asp	Asp	Leu	Val	Asp	Met	Trp	Ser	Thr	Met	Met	Glu	Pro
	195						200					205			
Met	Val	Val	Tyr	Asn	Gln	Gly	Tyr	Ile	Asn	Leu	Arg	Ser	Gly	Phe	Pro
	210				215						220				
Pro	Gly	Tyr	Leu	Ser	Phe	Glu	Ala	Ala	Glu	Lys	Ala	Lys	Phe	Asn	Leu
225					230					235					240
Ile	Gln	Ala	His	Ile	Gly	Ala	Tyr	Asp	Ala	Ile	Lys	Glu	Tyr	Ser	Glu
			245						250					255	
Lys	Ser	Val	Gly	Val	Ile	Tyr	Ala	Phe	Ala	Trp	His	Asp	Pro	Leu	Ala
		260						265					270		
Glu	Glu	Tyr	Lys	Asp	Glu	Val	Glu	Ile	Arg	Lys	Lys	Asp	Tyr	Glu	
		275					280					285			
Phe	Val	Thr	Ile	Leu	His	Ser	Lys	Gly	Lys	Leu	Asp	Trp	Ile	Gly	Met
	290					295					300				
Asn	Tyr	Tyr	Ser	Arg	Leu	Val	Tyr	Gly	Ala	Lys	Asp	Gly	His	Leu	Val
305					310					315					320
Pro	Leu	Pro	Gly	Tyr	Gly	Phe	Met	Ser	Glu	Arg	Gly	Gly	Phe	Ala	Lys
			325						330					335	
Ser	Gly	Arg	Pro	Ala	Ser	Asp	Phe	Gly	Trp	Glu	Met	Tyr	Pro	Glu	Gly
		340						345					350		
Leu	Glu	Asn	Leu	Leu	Lys	Tyr	Leu	Asn	Asn	Ala	Tyr	Glu	Leu	Pro	Met
		355					360					365			
Ile	Ile	Thr	Glu	Asn	Gly	Met	Ala	Asp	Ala	Ala	Asp	Arg	Tyr	Arg	Pro
	370					375					380				
His	Tyr	Leu	Val	Ser	His	Leu	Lys	Ala	Val	Tyr	Asn	Ala	Met	Lys	Glu
385					390					395					400
Gly	Ala	Asp	Val	Arg	Gly	Tyr	Leu	His	Trp	Ser	Leu	Thr	Asp	Asn	Tyr
			405						410					415	
Glu	Trp	Ala	Gln	Gly	Phe	Arg	Met	Arg	Phe	Gly	Leu	Val	Tyr	Val	Asp
		420					425						430		
Phe	Glu	Thr	Lys	Lys	Arg	Tyr	Leu	Arg	Pro	Ser	Ala	Leu	Val	Phe	Arg
	435						440					445			
Glu	Ile	Ala	Thr	Gln	Lys	Glu	Ile	Pro	Glu	Glu	Leu	Ala	His	Leu	Ala
	450					455					460				
Asp	Leu	Lys	Phe	Val	Thr	Arg	Lys								

465

470

<210> 8

<211> 489

<212> PRT

<213> *Sulfolobus solfataricus*

<400> 8

Met	Tyr	Ser	Phe	Pro	Asn	Ser	Phe	Arg	Phe	Gly	Trp	Ser	Gln	Ala	Gly
1				5					10					15	
Phe	Gln	Ser	Glu	Met	Gly	Thr	Pro	Gly	Ser	Glu	Asp	Pro	Asn	Thr	Asp
			20					25					30		
Trp	Tyr	Lys	Trp	Val	His	Asp	Pro	Glu	Asn	Met	Ala	Ala	Gly	Leu	Val
		35					40					45			
Ser	Gly	Asp	Leu	Pro	Glu	Asn	Gly	Pro	Gly	Tyr	Trp	Gly	Met	Tyr	Lys
	50					55					60				
Thr	Phe	His	Asp	Asn	Ala	Gln	Lys	Met	Gly	Leu	Lys	Ile	Ala	Arg	Leu
65					70					75					80
Asn	Val	Glu	Trp	Ser	Arg	Ile	Phe	Pro	Asn	Pro	Leu	Pro	Arg	Pro	Gln
				85					90					95	
Asn	Phe	Asp	Glu	Ser	Lys	Gln	Asp	Val	Thr	Glu	Val	Glu	Ile	Asn	Glu
			100					105					110		
Asn	Glu	Leu	Lys	Arg	Leu	Asp	Glu	Tyr	Ala	Asn	Lys	Asp	Ala	Leu	Asn
		115					120					125			
His	Tyr	Arg	Glu	Ile	Phe	Lys	Asp	Leu	Lys	Ser	Pro	Gly	Leu	Tyr	Phe
	130					135					140				
Ile	Leu	Asn	Met	Tyr	His	Trp	Pro	Leu	Pro	Leu	Trp	Leu	His	Asp	Pro
145					150					155					160
Ile	Arg	Val	Arg	Arg	Gly	Asp	Phe	Thr	Gly	Pro	Ser	Gly	Trp	Leu	Ser
				165					170					175	
Thr	Arg	Thr	Val	Tyr	Glu	Phe	Ala	Arg	Phe	Ser	Ala	Tyr	Ile	Ala	Trp
			180					185					190		
Lys	Phe	Asp	Asp	Leu	Val	Asp	Glu	Tyr	Ser	Thr	Met	Met	Glu	Pro	Met
		195					200					205			
Val	Val	Gly	Gly	Leu	Gly	Tyr	Val	Gly	Val	Lys	Ser	Gly	Phe	Pro	Pro
	210					215					220				
Gly	Tyr	Leu	Ser	Phe	Glu	Leu	Ser	Arg	Arg	His	Met	Tyr	Asn	Ile	Ile
225					230					235					240
Gln	Ala	His	Ala	Arg	Ala	Tyr	Asp	Gly	Ile	Lys	Ser	Val	Ser	Lys	Lys
				245					250					255	
Pro	Val	Gly	Ile	Ile	Tyr	Ala	Asn	Ser	Ser	Phe	Gln	Pro	Leu	Thr	Asp
			260				265						270		
Lys	Asp	Met	Glu	Ala	Val	Glu	Met	Ala	Glu	Asn	Asp	Asn	Arg	Trp	Trp
		275					280					285			
Phe	Phe	Asp	Ala	Ile	Ile	Arg	Gly	Glu	Ile	Thr	Arg	Gly	Asn	Glu	Lys
	290					295					300				
Ile	Val	Arg	Asp	Asp	Leu	Lys	Gly	Arg	Leu	Asp	Trp	Ile	Gly	Met	Asn
305					310					315					320
Tyr	Tyr	Thr	Arg	Thr	Val	Val	Lys	Arg	Thr	Glu	Lys	Gly	Tyr	Val	Ser
				325					330					335	
Leu	Gly	Gly	Tyr	Gly	His	Gly	Cys	Glu	Arg	Asn	Ser	Val	Ser	Leu	Ala
			340					345					350		
Gly	Leu	Pro	Thr	Ser	Asp	Phe	Gly	Trp	Glu	Phe	Phe	Pro	Glu	Gly	Leu
		355					360					365			
Tyr	Asp	Val	Leu	Thr	Lys	Tyr	Trp	Asn	Arg	Tyr	His	Leu	Tyr	Met	Tyr
	370					375					380				
Val	Thr	Glu	Asn	Gly	Ile	Ala	Asp	Asp	Ala	Asp	Tyr	Gln	Arg	Pro	Tyr
385					390					395					400
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Pro	Glu	Gly 35	Asn	Trp	Glu	Leu	Tyr 40	Asp	His	Ala	Lys	Leu	Gly 45	Leu	Asn
Ala	Tyr 50	Arg	Ile	Glu	Trp	Ser 55	Arg	Ile	Phe	Pro	Pro	Thr	Val	Glu	Ile
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Arg	Glu 210	Gly	Leu	Tyr	Asp	Leu 215	Ala	Tyr	Pro	Tyr	Ile	Thr	Glu	Asn	Gly
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